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ABSTRACT

The literature reporting research on message distortion in organizations is reviewed in this paper. Topics covered include: definitions of distortion/fidelity; measures of message display; measures of message interpretation; categories of distortion/fidelity derived from laboratory research; definitions of distortion/fidelity in naturalistic research; and methodology and measurement of distortion/fidelity in naturalistic research. Several generalizations are provided from the review of the literature: (1) no research was found that systematically controlled and varied the amount of distortion present in a particular message; (2) the questionnaire-based measures of distortion did not provide purely empirical data because they were assessing perceived rather than actual message distortion; and (3) more field research will be necessary to examine and substantiate the nature and effects of distortion in actual organizations. (MKM)

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Defining and Measuring Message Fidelity in Organizational Communication Research

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Defining and Measuring Message Fidelity in Organizational Communication Research

Every organization of any size is confronted with the need to produce, disseminate, and reproduce messages (directives, regulations, rules, policies, compliments, etc.). The efficiency and effectiveness with which the organization functions is usually a fairly direct result of the fidelity of the message reproduction process. Redding (1972) has noted, however, that it is "unrealistic to expect perfect fidelity even when a message has to travel only from one single individual to another single individual without any intervening relays. Intuitively, therefore, one can predict that losses in fidelity will be multiplied in direct proportion to the number of links in a human communication chain" (p. 105).

Most research on message fidelity has been completed under laboratory conditions using chains of subjects. A minimum sequence necessary to investigate the fidelity of a reproduced message is three units--an originator of the message, a relayor of the message, and a terminator of the message. In order to accelerate the potential decay process and highlight changes, chains of up to twenty subjects have been used (Bartlett, 1932).

Little research has been completed on message fidelity in naturalistic organizational settings, or using designs that closely simulate such settings. Redding (1972) also observed that "the typical laboratory study, using highly detailed, complex messages, and low levels of motivation on the part of subjects, may present so many differences from which occurs in 'real life' that generalizations are extremely hazardous" (p. 111).

He concluded that the available research makes it impossible to make any predictions about losses in accuracy of message of organizations.

Definitions of Distortion/Fidelity

Fidelity generally refers to the ability of a receiver to reproduce its input accurately; hence, the recording industry refers to high-fidelity sound reproduction. In human communication, fidelity is used to describe the degree of correspondence between the initiated message and the reproduced message. A message has at least two dimensions: display and interpretation. A display consists of verbal and nonverbal actions (both vocal and physical), appearances, and other sense impressions. In communicating, a person simply creates and presents a display of sounds, movements, and emblems which can be taken to symbolize or represent something else. The display dimension of a message is a pattern of symbols which can be perceived. Individuals have the capacity of interpreting aspects of a display. An interpretation is the act and process of assigning meaning to or making sense out of a display.

The measurement of message fidelity is complicated by the two dimensions of display and interpretation. If fidelity is the degree of correspondence between an initiated message and a reproduced message, then we must be prepared to measure the correspondence between an initiated display and some form of reproduced display, and the correspondence between some form of intended meaning or interpretation and some form of imputed interpretation or meaning. A lack of fidelity is usually demonstrated by some type of change between the reproduced message display and the initial display, or difference between an intended meaning and the meaning inputed to the display.

Measures of Message Displays

Serial reproduction studies illustrate most clearly measures of distortion that rely quite directly on a comparison of the correspondence between message displays. A message (usually verbal, but often pictorial)

is prepared in advance so as to meet specific criteria regarding length, content, and style. The message display is presented to a subject wno observes the display and, after a specified period of time, reproduces the message display so as to correspond as closely to the initial message display so as to correspond as closely to the initial message display as possible. The reproduction may be accomplished by writing or drawing the disply, or by orally repeating the message into a recorder. Fidelity of the message display is determined by comparing the original message display with the reproduced message display. With verbal messages this can be done directly by (1) counting the words that are exactly the same in both displays and/or (2) counting the number of specified themes occuring in both displays. Some research has used Cloze Procedure (Taylor, 1956) which provides an objective measure of the manner in which a subject reproduces the initial message display by filling-in words which were systematically omitted from the original. In any case, the fidelity of the message is measured by comparing an original message display with a later message display which was produced by recall or by a completion task.

Measure of Message Interpretation

Measuring the correspondence between an intended meaning of a message and an imputed meaning of a message involves procedures different from those involved in comparing message displays. Research that attempts to measure the meaning of a message usually employs some form of attitude instrument with a pre and post administration to determine shifts in meaning. A semantic differential-type scale is probably the most commonly used form of measurement. An adaptation of the semantic differential called Associative Group Analysis (Szalay, etal, 1968) is a procedure that seems to have some promise for assessing a person's meaning of a concept, but its application in organizational communication is still untested. In this instance, the effort is directed toward finding some correspondence between the intended meaning of a message and the meaning imputed to the message by another person.

Laboratory research on the serial reproduction of information has lead to the identification and classification of changes that occur when messages are relayed through chains of subjects. Although the analysis of themes has been the most common and productive form of fidelity measure (Paul, 1959), researchers have periodically used other procedures mentioned above. In fact, Brissey (1964) devised a procedure for measuring the fidelity of a message by having subjects complete a task described by a message rather than by analyzing the reproduced message directly. Subjects were given instructions concerning how to complete a pre-arranged display on a pegboard. Fidelity was measured by the extent to which subjects placed pegs in the right holes. Brissey reasoned that as the adequacy of the message decreased, a receiver's uncertainty with respect to placing pegs correctly in the display would increase. Increased message fidelity would result in decreased errors. Research by Stadstad (1969) and Hegstrom (1970), also using the pegboard insturment, indicates that a completion task may be an effective measure of message fidelity. The pegboard instrument allowed errors of addition and omission in message reproductions to be identified.

Categories of Distortion/Fidelity Derived from Laboratory Research

Greatly influenced by Bartlett (1932), but using terminology derived from Wulf (1922), Allport and Postman (1947) identified three fundamental changes that occur during the reproduction of a message: (1) leveling, which occurs when details that are important to an accurate report of an incident are omitted; (2) sharpening, which occurs when details become selectively retained and highlighted, often around a central theme; and (3) assimilating, which occurs when details are modified to conform to the needs, interests, and feelings of the relayor.

Paul (1959) developed a categorization system somewhat different from Allport and Postman, although it also resulted in three kinds of changes:

(1) skeletonization, which involves the stripping away of details and seems to approximate both leveling and sharpening processes; (2) importation, which involves the invention of details but does not seem to compare directly with any of Allport and Postman's categories; and (3) transformation, which appears to be the result of combinations of skeletonizing and importing.

Lee and Lee (1957) listed five kinds of errors that occur during the serial reporduction of messages: (1) omissions, details that are not mentioned at all and appear to be overlooked by a relayor; (2) losses, details that are mentioned by a relayor but that are dropped later; (3) changes, details that are moved, roles made different, events reported in a different order; (4) additions, elaborations on details that are part of the original report; and (5) qualified statements adjusted to definite statements, involving dropping select phrases such as "I think," "It may have been," and "It look like." Although these errors might be more parsimoniously accounted for by reference to either Allport and Postman or Paul's systems, the Lee and Lee categories refer more specifically to types of changes that occur in verbal messages than do either of the other systems.

Both the Allport and Postman and Paul systems demonstrate the difficulty of differentiating between consequent and antecedent when discussing communicative phenomena. Do the terms sharpening, leveling, assimilating, importing, skeletonizing, and transforming, for example, represent types of changes that occur during serial reproduction or do they represent processes that influence the omission and addition of details? It may be that such terms refer to both activities. Whether skeletonizing and importing are basic processes that cause or at least correlate with changes in message displays as they are relayed is still somewhat equivocal.

Perhaps the simplest paradigm for categorizing types of changes is that suggested by Hsia (1971): additions and omissions. All other modifications that cannot be accounted for simply by the direct addition or omission of details are probably the result of some combination of the two. Nevertheless, these systems illustrate the continuing need to develop ways of measuring the fidelity of messages, and the difficulty of devising objective measures of both display and interpretation dimensions of messages.

Definitions of Distortions/Fidelity in Naturalistic Research

Studies involving the distortion of verbal messages in organizations define and measure one or more of the types of changes described above. The studies of organizational communication referred to in this paper defined verbal communication distortion consistent with the categories of distortion identified in laboratory studies on the serial reproduction of information.

Omissions

The most frequently used definition of message distortion is omission--the deletion of a detail from the original message. A majority of the studies defined distortion, partially or entirely, in this manner.

O'Reilly and Roberts (1974) described the process of deleting bits of information as "selective filtration." A bit of information in their study was a single idea or concept of one or more sentences, pre-written on a slip of paper, which the subject either retained or transmitted with other bits in a message to his superior.

O'Reilly (1978) defined distortion as the omission of information (a written statement on a slip of paper) which was the result of blocking, screening, or suppressing actions.

Krivonos (1976) defined distortion as the omission of a bit of information; however, subjects created messages of their own based on one of

several underlying ideas. The precise wording used to express the ideas was not important. If the words used to communicate a particular bit of information were different from the original, but seemed to convey the same idea, then the bit was said to have been reproduced without distortion. Thus, as long as the idea had been expressed somehow in the reproduction, it was not measured as an omission.

Housel (1977) used the terms "errors of omission" as a definition of distortion. Subjects were given several opportunities to obtain information, which, unknown to them, had been previously analyzed and divided into bits. If subjects did not include a particular bit in their messages, the bit was said to be omitted and the message distorted.

Davis and O'Connor (1977) defined distortion in terms of deletions or omissions. A bit of information that had been part of the original message, but which a respondent reported as not having received, was considered omitted. Again, the precise wording was not important but just the presence of the underlying idea allowed the item to be scored as included.

Alterations

Several, although not all of the studies, also defined distortion or lack of fidelity in terms of alterations in the original message. Alteration appears to refer to some change in the meaning of parts of the message rather than in the wording used to express the basic idea. For example, O'Reilly (1978) and Krivonos (1976), in addition to counting the number of items of information which the subject failed to transmit or receive, also noted the number of items which had been changed in some way. O'Reilly (1978) suggested that such alterations were the result of sharpening or leveling. Level (1978) and Athanassaidas (1974) both seemed to consider alterations as a form of distortion. They attributed the changes not to sharpening or leveling tendencies but to pressures derived from having responses evaluated by a superior rather than presenting them anonymously.

Additions

Additions to an original message are somewhat similar to changes except that an added idea is not found, in any form, in the original, whereas a change implies that an idea already included in the message has been altered in some way. Although additions appear considerably less frequently than omissions and changes, the inclusion of an item of information not formerly in the message does appear to occur on occasion. O'Reilly (1978), Krivonos (1976) and Davis and O'Connor (1977) consider additions as a specific indicator of distortion.

Gestalt Sense of Inaccuracies

Five studies did not specify precisely whether distortion was defined as a deletion, change, or addition (third study of O'Reilly (1978), Roberts and O'Reilly (1974), Housel (1977), Sussman (1974)). Rather than indicating a particular type of distortion, these studies referred to distortion of a message in a general or gestalt sense. The terminology used was "inaccurate information," "a gestalt perception," and "summation." Subjects were asked to identify how accurate he/she perceived a particular message to be. Krivonos (1976) defined distortion as a gestalt perception of accuracy as judged by an observer.

Differences in Scores

Studies conducted by Maier, et al (1963) and Read (1962) suggest that distortion in organizational communication can be conceptualized as differences in agreement scores of a superior-subordinate pair. Both studies implied that if the pairs are communicating without distortion, agreement scores would tend to be higher, but if their messages tended to be distorted, the scores would be lower. Hence, organizational communication distortion could be defined as the degree to which a superior-subordinate pair lack agreement.

Inability to Complete a Task

In the real organizational world, the measure of message fidelity may in fact be more related to how a person completes his/her work than it does to how precisely either the message display or the meaning of the message are reproduced. A popular laboratory exercise on message reproduction involves having one person give another person instructions on how to reproduce a drawing. In Haney's (1964) research, the figures appeared to be drawings of domino blocks. The criteria for accuracy were the orientation of the rectangles to one another and the arrangement of the circles within the rectangles. To be considered as accurate, the reproduced drawings had to meet both criteria. Brissey (1974) had subjects complete a design on a peg board. Any holes not filled and all pegs outside the design were considered to be inaccuracies. Alkire, et al (1968) had subjects select the correct design from among several based on instructions from another person. In each of these studies, the initiator of the messages usually receives a copy of the design or figure and is asked to create the initial descriptive message. In the studies referred to in other sections of this paper, the researchers had messages prepared in advance. The concept of lack of fidelity in a message as a function of inability to complete a task suggests that inaccuracies are not merely poor reproductions of a precise message, but faulty conceptions at the origination of the initial message. Because of difficulties in research design, especially in devising ways to measure the completion of actual organizational tasks in relationship to the organizational messages intended to instruct subjects in the completion of the tasks, studies of message fidelity have not used task completion definitions and procedures.

Methodology and Measurement of Distortion/Fidelity in Naturalistic Research

Because the major focus of this paper is on research which has been conducted in naturalistic settings rather than in the laboratory, all but three of the relevant studies were conducted in organizational settings such as military units or hospitals. The three studies which were not carried out in the field--O'Reilly and Roberts (1974) and the first two studies reported in O'Reilly (1978)--were included in this report because the researchers carefully created a simulated organizational setting, described to the subjects their organizational roles and duties, and asked the subjects to role play as if they actually worked in the simulated situation.

The methodologies employed in the studies varied considerably depending upon the definition of distortion, the type of organization, and the number or subjects employed in each study. Generally, however, there were three methods used: (1) a role-playing situation where the participants actually received and transmitted information which was then analyzed item-by-item; (2) a scale on which subjects were asked to indicate the amount of distortion in a particular message; and (3) a check-list in which items of information included in the original could be recognized and marked.

Message Set Analysis

In addition to the three studies which were not conducted in actual organizations, three field studies employed a role-playing technique to assess how various factors (such as trust, status, etc.) affected the level of fidelity in an employee's transmition of a message.

The first two studies reported in O'Reilly (1978) and O'Reilly and Roberts (1974) used approximately the same role-playing situation and distortion measuring devices. In the first study in O'Reilly (1978) and O'Reilly and Roberts (1974), graduate and undergraduate students

volunteered to role-play positions as subordinates, superiors and peers. The subjects were given a description of the company they supposedly worked for, their position, and a special problem to which they were assigned to work out a solution. The problem had to do with a law suit against the company for discriminatory practices.

At the beginning of the experimental session, the subjects were given an envelope containing 58 items of information which they could use in reporting their solution to the problem. These 58 items had been precoded as important, unimportant, favorable or unfavorable, although the subjects themselves did not know about such ratings. The items consisted of such things as the number of minority employees, salaries, turn over rate, etc.

In order to emphasize several differences in the treatment groups (trust and influence of the individual requesting the solution to the problem), the subjects were presented with a video-taped presentation of an actor (a person requesting information) asking that the subjects seriously consider the problem and send him their solution. The subjects then read the 58 items, selected which items each wanted to include in the solution to the problem and put them into envelopes which they gave to the experimenters to pass on to the person requesting the information.

The distortion of the transmitted messages of the subjects was measured by counting the number of items that were not included in the envelopes. The items which had been sent by the subjects were then categorized by the importance and favorability of the items and totaled by category.

O'Reilly's (1978) second study followed the same procedure except that the subjects did not see the video-tape presentation, were given only 24 items, and rather than choosing to retain or send each separate item, the subjects were asked to indicate how they would

send each item if they were to actually do so: whether they would (a) expand, (b) research further, (c) leave unchanged, (d) summarize, or (e) omit each of the 24 items in the final report they were hypothetically requested to send. The problem situation and content of the items was the same as in the previous two studies.

Necessarily so, the measure of the distortion was different in this study than the previous two. Rather than just counting the number of items transmitted, each item was assigned a numeric value according to how the subject had indicated he would have sent the item. These numbers were then added together to provide an overall index of distortion. A low score indicated a tendency to sharpen while a high score suggested a tendency to level. Furthermore, the 24 items were categorized according to the four major types of information mentioned in the previous two studies: favorable-important, favorable-unimportant, unfavorable-important, unfavorable-unimportant. A subtotal leveling and sharpening score was computed in each category.

Scales for Estimating Distortion

Using the results of a pretest questionnaire, Housel (1977) developed two role-playing situations which demanded that the subordinates communicate with their superiors, directly or indirectly, to request more information about a given problem or to transmit a final summary of the total amount of information obtained and a solution to the problem. In each role-playing situation, the subjects were given a written indication as to the type of reaction they would receive from their superior upon communicating with him. In one problem situation, the subjects supposedly heard that a new employee was saying things about them to their superior behind their back because of two policy violations the subjects committed in the presence of the new employee.

Two different measures of distortion were used to determine how well subordinates communicated a specific message upward to their superiors: (1) Both the superior and subordinate were asked to rate on a nine-point scale how accurate they had perceived the communication to be. Apparently, this measure was looking at a general question of message fidelity--distortion was not an acutal omission or alteration per se, but just a feeling that communication was somehow inaccurate. (2) The message communicated to the superior was compared to the original items of information, and all omissions and inaccurately reported bits were counted.

The role-playing situation and procedure employed by Krivonos (1976) consisted of four stimulus situations from which the subjects were instructed to write messages to their superiors. These stimulus situations contained information about a task relevant or irrelevant problem, which was favorable or unfavorable to the subjects. Writing the messages took the participants about an hour and a half to complete.

As in Housel (1977), Krivonos analyzed the data obtained from the role-playing situations with two types of measures: (1) a measure of perceived or "judged" distortion, and (2) a measure of actual or computed distortion. Krivonos, however, measured the perceived distortion by means of three observer judges rather than by means of the superior and subordinate themselves. These three judges used two simple scales to evaluate each of the written messages of the participants. The first scale categorized the items included in the message according to whether each item was favorable, deleted, added, internalized, and apologetic in nature; and the second scale consisted of the judges overall "gestalt" perception of distortion.

The actual measures of distortion consisted of a similar item-by-item analysis of the message content as described in previous studies. Each item in the stimulus situation was checked to see if it had been omitted by the subject. All items in the message not found in the original situation were counted as additions and all items contained in the subjects' messages, whether found in the original or not, were rated according to their favorability.

Alkire, et al (1968) employed a simple role-playing procedure involving pairs of sorority members. One member of each pair was a sender while the other was a receiver. Senders described a graphic design to the receivers, who, without being able to see the sender or the senders' design, were supposed to identify from 16 similar designs which was the one the senders described. The senders' descriptions of the designs were taped and later played to a new set of receivers to test for the actual "quality" or amount of distortion and inaccurate information in the messages.

Questionnaires and Checklists

The studies, which did not employ a role-playing situation, assessed distortion in organizational communication by means of a questionnaire or interview. Roberts and O'Reilly (1974), the third study in O'Reilly (1978), and Sussman (1974)used similar instruments. All three studies requested the respondents to indicate on a specified scale the level of distortion perceived in the messages communicated and/or received.

The third study in O'Reilly (1978) administered a questionnaire to personnel in three military organizations, which contained five, of a total of 35, Likert-type questions, assessing the perceived level of message distortion. For example, one of the five questions read: "When receiving information from the sources listed below (below was a list of other personnel in the organization), how accurate would you

estimate it usually is?" The respondents' answers to the five questions were summed to form an index on which a high score indicated a propensity on the part of the sender to level or suppress information being sent upward.

Five similar 7-point questions were asked on a questionnaire used by Roberts and O'Reilly (1974). One of the questions read: "When transmitting information to your immediate superiors how often do you summarize by emphasizing those aspects which are important and minimizing those aspects which are unimportant?"

Sussman (1974) employed a slightly different approach by giving 32 superiors a booklet containing 20 messages representative of typical task-oriented messages the supervisors were likely to receive. Each superior was asked to indicate on a 6-point, bi-polar scale how accurate they estimated each message was likely to be. A response of six indicated that the supervisor perceived the message to be totally accurate, while a one indicated the opposite.

Athanassaidas, et al (1974) and Level (1978) likewise employed two very similar questionnaires and distortion indices. Level administered Gordon's Personal Profile and Personal Inventory, in two parts, to subordinates from various organizations. The first part was given at an earlier time then the second. The first part was anonymous while the second, as the respondents had been told, was going to be passed on to the subordinates' superiors for the purpose of cooperative evaluation. The questions on the two parts apparently corresponded such that an index was constructed from the responses of both questionnaires by subtracting the second part of the questionnaire from the first.

Athanassaidas used essentially the same approach except that instead of using the same Gordon's Personal Profile and Personal Inventory for

both parts of the study--the anonymous and acknowledged questionnaires--he used the profile only for the first part. For the second questionnaire, corresponding questions on a min-max scale were used on the same factors assessed by the profile. The index of distortion was the absolute difference between the respondents' answers on Gordon's Profile and their answers on the min-max scale.

In addition to assessing the distortion of upward communication by means of the Gordon Profile, Level also tried to measure downward communication distortion by requesting the superiors of the subordinates who had responded to the profile to respond to a critical incident-type quesitonnaire.

Maier et al (1963) and Read (1962) both asked superior-subordinate pairs to rank-order the seriousness of a set of problems in each of five areas: communication and coordination, budget, pressure, technical problems and administration. Using Kendall's tau, the two rank orders were correlated for each problem category. A mean tau over the five problem categories provided the overall statistical index of agreement for each superior-subordinate pair.

Maier, et al (1963) also reported a slightly different agreement study using a distinct set of superior-subordinate pairs. In this study, the superior and subordinate member of each pair were interviewed seperately and two independent sets of ratings were obtained of superior-subordinate agreement on various job-related problems. A five-point scale was used in which 0 represented "very little or no agreement," and 4 represented "virtually complete agreement."

Mellinger (1956) identified specific pairs within a large government organization (not necessarily superior-subordinate pairs) and obtained from both members of each pair the following information: (1) their attitudes about the long run consequences of a new research

program, (2) their attitudes of trust toward each other, (3) their reports as to whether they ever had discussed the new program with each other, and (4) their estimates of each other's attitude about the issue of the new program. The difference between the answers of the respondents in each pair, particularly the difference in their perceptions of each other's attitudes was used as an index of accuracy of communication between the members of the pair. Consequently, distortion was measured by the degree to which the index indicated inaccurate communication.

Davis & O'Connor (1977) conducted their check-list study using Keith Davis' ECCO analysis (Davis, 1953). Information sent through regular channels was measured via a check-list to assess the degree to which the original message had been leveled, sharpened or assimilated by the receivers of the message. Each of the employees who received the message in some form was given a copy of the original message and then asked to indicate which bits of the message had been received, not received, received but in an altered form, or received but which were not part of the original message.

Comments

Several generalizations can be made from the foregoing review of the literature reporting research on message distortion in organizations. First, no research was found which systematically controlled and varied the amount of distortion present in a particular message. In other words, fidelity was always measured as the result of the independent variable, and was employed as the dependent measure, rather than an independent one. All the studies included in this report, except perhaps Alkire, et al (1968), examined, not the effects of message fidelity on employee attitude,

satisfaction, etc., but rather the effects of trust, status, importance of information, etc. on the degree of distortion present in a message.

Second, the questionnaire-based measures of distortion, for the most part, did not provide purely empirical data because they were assessing "perceived" rather than "actual" message distortion. On the other hand, the more empirical data, obtained by an item-by-item analysis of a communicated message compared with an original, was based on role-playing a situation and not on real life, everyday communication processes. Only Davis & O'Connor (1977) used an item-by-item analysis of data obtained in everyday organizational settings.

And third, it can be concluded that while the concept of distortion is widely accepted and even empirically supported by laboratory research, a great deal more field research will be necessary to examine and substantiate the nature and effects of distortion in actual organizations.

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